

**GEO 647 H (3-3) AREA III**

**ADVANCED RESEARCH AND APPLICATIONS IN GEOGRAPHIC INFORMATION SYSTEMS**

**Instructor: Dr. Dan Jacobson**

Office: ES 446

Office hours: T 2-3 or by appointment

Phone: 220-6192

e-mail: dan.jacobson@ucalgary.ca

**CA: Rod Peacock**

Office: ES 415

Office hours: TBA

Phone:

e-mail: rpeacock@ucalgary.ca

**Official Course Description:**

Focus on advanced GIS applications in core areas; methodological developments in GIS and current research directions in GIS.

**Prerequisite:**

Consent of the Department

**Supplementary Fees:** (*field trips etc*). *N/A*

**Course Content**

This is an advanced course designed to increase the student's understanding of advanced applications and current research in geographic information systems. The two main objectives of the course are (1) to acquire advanced knowledge of the fundamental concepts in GIS, and (2) become familiar with current applications of GIS technology for effective spatial analysis and the communication of geographic information. The first portion of the course will be traditional lecture/laboratory-based teaching that examines advanced core concepts of GIS. The second portion of the course will focus on student-based research about current applications and developments of GIS. Students will conduct independent research on topics of their choice, and convey this information to the class via an oral presentation and a web-based independent research report reports.

**This will involve:**

- Developing an advanced understanding in fundamental core concepts in GIS
- Exploring these concepts in a technical lab based setting
- Promoting critical thinking and reasoning with data in a GIS application based setting
- Developing methodologies and procedures for independent research projects

**Context and wider aims of the course:**

The goals are to integrate the wider theoretical background of Geographic Information Science with specific technical situations, and to explore these throughout the duration of the course, as they relate to specific applications or data.

**Key Topic Areas Include:**

Conceptual Foundations, Cartography and Visualization, Data Analysis, Design Aspects, Data Modeling, Data Manipulation, Geocomputation, Geospatial Data, Geographic Information Systems, Science, Technology and Society, Organisational and Institutional Aspects, Research Agendas, Research and Applications

## **Lab Activities and Student Projects:**

Weekly lab activities will run for the first portion of the course. The purpose of the lab exercises is to compliment the material presented in the lectures, and to give students hands-on experience with advanced topics in GIS. Topics may include, but are not limited to, data acquisition & data migration, evaluation of data quality, GIS database design, and communicating geographic information. We will also review journal articles of interest for open class discussion.

Each student will also prepare a term project on an advanced topic in Geographic Information Science. The outcome of this research will be presented to the class and be available in the form of a web-based report.

**Blackboard:** <http://blackboard.ucalgary.ca/>

**Required Texts:** None

No single text covers all of the material presented in this course. However, the text below is suggested as a starting point: it provides the most concise and comprehensive overview.

Longley, P., Goodchild, M., Maguire, D., & David, R. (Eds.). (2005). *Geographic Information Systems and Science*. (2nd Edn) New York: John Wiley & Sons. ISBN: 0-470-87001-X

## **Supplementary texts:**

Duckham, M, Goodchild, M.F., Worboys, M.F. (Eds.) . (2003) *Foundations of geographic Information Science*. New York: Taylor and Francis ISBN: 0-415-30726-0

Burrough, P.A. and R.A. McDonnell. 1998. *Principles of Geographic Information Systems*. Oxford University Press, London.

Worboys, M.F. 1995. *GIS: A Computing Perspective*. Taylor and Francis, London.

Zeiler, M. 1999. *Modeling Our World: The ESRI Guide to Geodatabase Design*. Environmental Systems Research Institute, Inc. (ESRI) Press, New York.

**Readings/Manual:** Additional readings, laboratory manual and links to electronic resources will be made available during the course period, via Blackboard.

## Grading (Weighting)

The final examination for this course is take home and therefore will not be scheduled by the Registrar's Office. It is not essential to pass all elements/components to pass the course as a whole, however each element of the course is closely inter-related.

Students will be evaluated in three areas: (1) their knowledge of lecture materials, including classroom participation and discussion (2) laboratory work, and (3) the term project. The Final project is expected to demonstrate knowledge of the conceptual issues and research applications in GIS. The application of this knowledge will be evaluated through laboratory exercises and individual research projects. The distribution of marks will be:

Laboratory exercises:	40%	
Journal review	5%	
Project:	30%	Comprised of:
		Proposal: 5%
		Product and Report: 20%
		Presentation: 5%
Participation	10%	Comprised of:
		ESRI online training 4%
		Website 3%
		Classroom Discussion 3%
Quiz 1 (mid term)	5%	
Final Exam (take home)	10%	

## Grading System:

Grade	Percent	Graduate Description
A+	95.0 - 100	Outstanding
A	90.0 - 94.9	Excellent – superior performance showing comprehensive understanding of the subject matter
A-	85.0 – 89.9	Very good performance
B+	80.0 – 84.9	Good performance
B	75.0 – 79.9	Satisfactory performance
B-	70.0 – 74.9	Minimum pass for students in the Faculty of Graduate Studies
C+,C,C-	60.0 – 69.9	All grades below B- are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements.
D+, D	50.0 – 59.9	
F	<50.0	

## Plagiarism

Academic dishonesty is not an acceptable activity at the University of Calgary and students are **strongly advised** to read the Student Misconduct section in the University Calendar. Quite often, students are unaware of what constitutes academic dishonesty or plagiarism. The most common are 1) presenting another student's work as your own 2) presenting an author's work or ideas as your own without proper referencing and 3) using work completed for another course. This activity will not be tolerated in this course and students conducting themselves in this manner will be dealt with according to the procedures outlined in the calendar.

### Re: Posting of Grades and Picking-up of Assignments

- Assignments will be handed back only in class or by the Professor at pre-arranged time(s).
- Grading and assignment evaluations will be available in the secure Blackboard environment
- Posting of grades will be at the discretion of each Professor and, if posted, they will be scrambled. Grades will **not** be available at Geography's main office.

### Contact Information for Student and Faculty Representation

- SU VP Academic Phone: 220-3911 and e-mail: [suypaca@ucalgary.ca](mailto:suypaca@ucalgary.ca)
- SU Faculty Rep. Phone: 220-3913 and e-mail: [socialscirep@su.ucalgary.ca](mailto:socialscirep@su.ucalgary.ca)

### Campus Safewalk

Campus Security, in partnership with the Students' Union, provides the Safewalk service, 24 hours a day, to any location on Campus including the LRT, parking lots, bus zones and University residences. Contact Campus Security at 220-5333 or use a help phone, and Safewalkers or a Campus Security officer will accompany you to your Campus destination.